What is claimed is:

1   1. A heterodyne system, comprising:

2   a first signal path receiving a drive signal and providing a first signal in response to the

3   drive signal;

4   a second signal path receiving the drive signal and providing a second signal in response

5   to the drive signal, at least one of the first signal path and the second signal path scaling the

6   frequency of the drive signal so that the frequency of the first signal divided by the frequency of

7   the second signal is an integer ratio; and

8   a mixer receiving the first signal and the second signal, providing a series of mixing

9   products of the first signal and the second signal.

1   2. The heterodyne system of claim 1 wherein the series of mixing products includes a

2   designated signal, and wherein mixing products in the series other than the designated signal are

3   offset in frequency from the designated signal by integer multiples of the frequency of the second

4   signal divided by the denominator of the integer ratio when the integer ratio is reduced to lowest

5   terms.

1   3. The heterodyne system of claim 1 further comprising at least one filter selecting a

2   designated one of the mixing products in the series.

1   4. The heterodyne system of claim 2 further comprising at least one filter selecting the

2   designated signal and rejecting mixing products in the series other than the designated signal.

1   5. The heterodyne system of claim 1 wherein the first signal path includes a frequency

2   multiplier.

1   6. The heterodyne system of claim 1 wherein the second signal path includes a modulator

2   imposing modulation on the second signal.

1   7. The heterodyne system of claim 5 wherein the second signal path includes a modulator

2   imposing modulation on the second signal.

1   8. The heterodyne system of claim 5 wherein the frequency multiplier includes cascaded

2   frequency doublers.

1   9. The heterodyne system of claim 1 further comprising a source providing the drive

2   signal to the first signal path and the second signal path.

1   10. The heterodyne system of claim 9 further comprising a switchable bypass path

2   alternatively coupling the designated signal and the drive signal to an output.

1   11. A heterodyne system, comprising:

2   a first signal path scaling the frequency of a received drive signal by an integer multiple

3   to provide a first signal;

4   a second signal path receiving the drive signal and providing a second signal in response

5   to the drive signal; and

6   a mixer receiving the first signal and the second signal, and providing a series of mixing

7   products of the first signal and the second signal.

1   12.   The heterodyne system of claim 11 wherein the second signal path includes a

2   modulator for imposing modulation on the second signal.

1   13. The heterodyne system of claim 12 wherein the modulator is an IQ modulator.

1   14. The heterodyne system of claim 11 further comprising at least one filter selecting a

2   designated mixing product from the series of mixing products.

1   15.   The heterodyne system of claim 14 wherein the at least one filter has a stopband

2   rejecting mixing products in the series that are offset in frequency from the designated mixing

3   product by integer multiples of the frequency of the second signal.

1   16. The heterodyne system of claim 11 further comprising a source providing the drive

2   signal to the first signal path and the second signal path.

1   17. A heterodyne method, comprising:

2   receiving a drive signal;

3   providing a first signal and a second signal in response to the drive signal, wherein the

4   frequency of the first signal divided by the frequency of the second signal is an integer ratio; and

5   mixing the first signal and the second signal to provide a series of mixing products of the

6   first signal and the second signal.

1   18. The heterodyne method of claim 17 wherein the series of mixing products includes

2   a designated signal, and wherein mixing products in the series other than the designated signal are

3   offset in frequency from the designated signal by integer multiples of the frequency of the second

4   signal divided by the denominator of the integer ratio when the integer ratio is reduced to lowest

5   terms.

1   19. The heterodyne method of claim 17 further comprising selecting a designated one of

2   the mixing products in the series.

1   20. The heterodyne method of claim 17 further comprising imposing modulation on the

2   second signal.